Evaluate Habitat Use and Population Dynamics of Lampreys in Cedar Creek

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Columbia River Fisheries Program Office
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Outline

I. Project History/Overview
II. Objectives
    a. Methodology
    b. Results
III. Gear Efficiency
IV. Future Work for 2004

Project Overview/History

- BPA Project # 2000-014-00
- 5th year of project operations
- Lewis River Drainage, So. Washington
- Year-around field activity
- Staff: 3 FTE's, fish biologists
- http://columbiariver.fws.gov/

Location Map

Cedar Creek, WA.

Objectives

1. Larval distribution and habitat use

2. Outmigrant abundance and migration timing

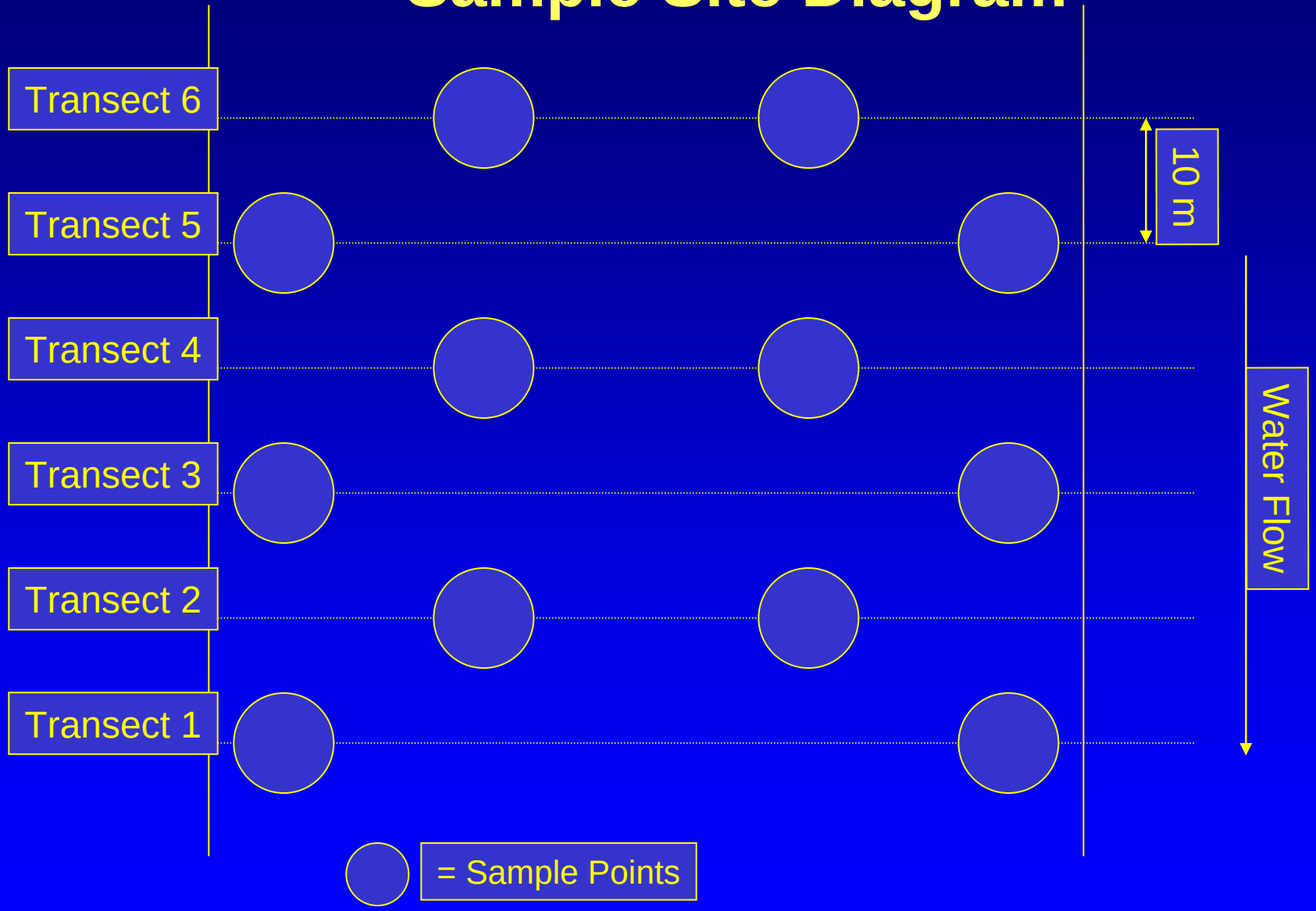
3. Abundance and migration timing of adults

4. Spawning habitat

Objective 1

- Determine larval lamprey distribution and habitat use
- Method: Stratified systematic point sampling technique
    - Electrofishing
        - –70% depletion
        - –2 pass minimum
        - –5 pass maximum
    - Habitat

Sample Site Diagram



Habitat Measurements

Habitat Characteristics	Sample Reach	Transect	Point
Water Temperature	X		
pH	X		
DO %	X		
DO mg/L	X		
Conductivity	X		
Specific Conductivity	X		
Gradient	X		
GPS	X		
Wetted Width		X	
Canopy Cover		X	
Depth			X
Velocity			X
Substrate Composition			X
Fine Substrate Depth			X
Bycatch			X

Objective 1 Results

- Electrofishing

Year	# Reaches	# Fish	% Quads with Fish	Average Density
2000	19	413	31	7
2001	9	55	12	4
2002	9	77	32	3

- Fish in relation to their habitat
  - Negative relationship with water velocity
  - Positive relationship with clay, silt, sand
  - Backwater, depositional, side channel areas

Objective 2

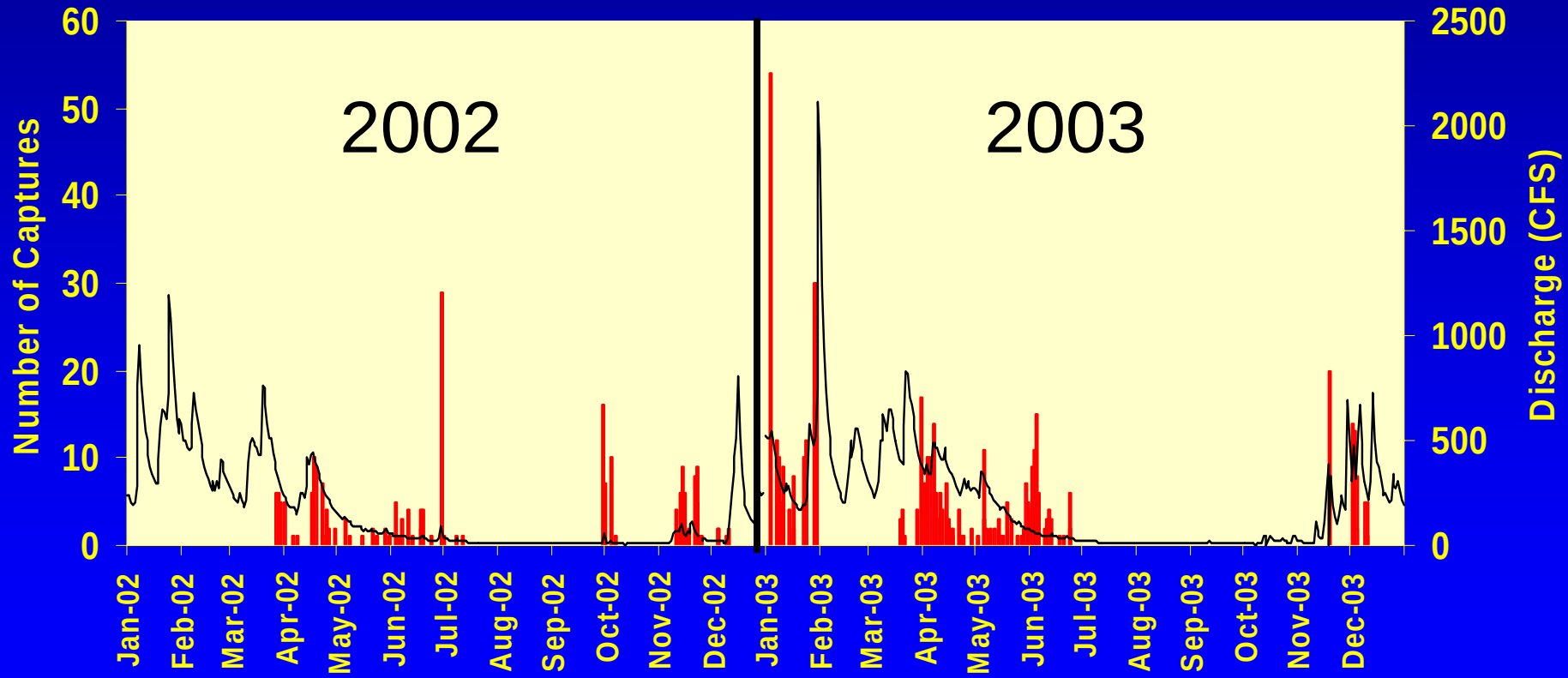
- Determine outmigrant abundance migration timing
- Method:
  - 5’ screw trap, 4 km upstream of mouth
  - Length, weight, stage
  - Tagged and released
  - Trap Efficiency
  - Trap Retention

Objective 2 Results

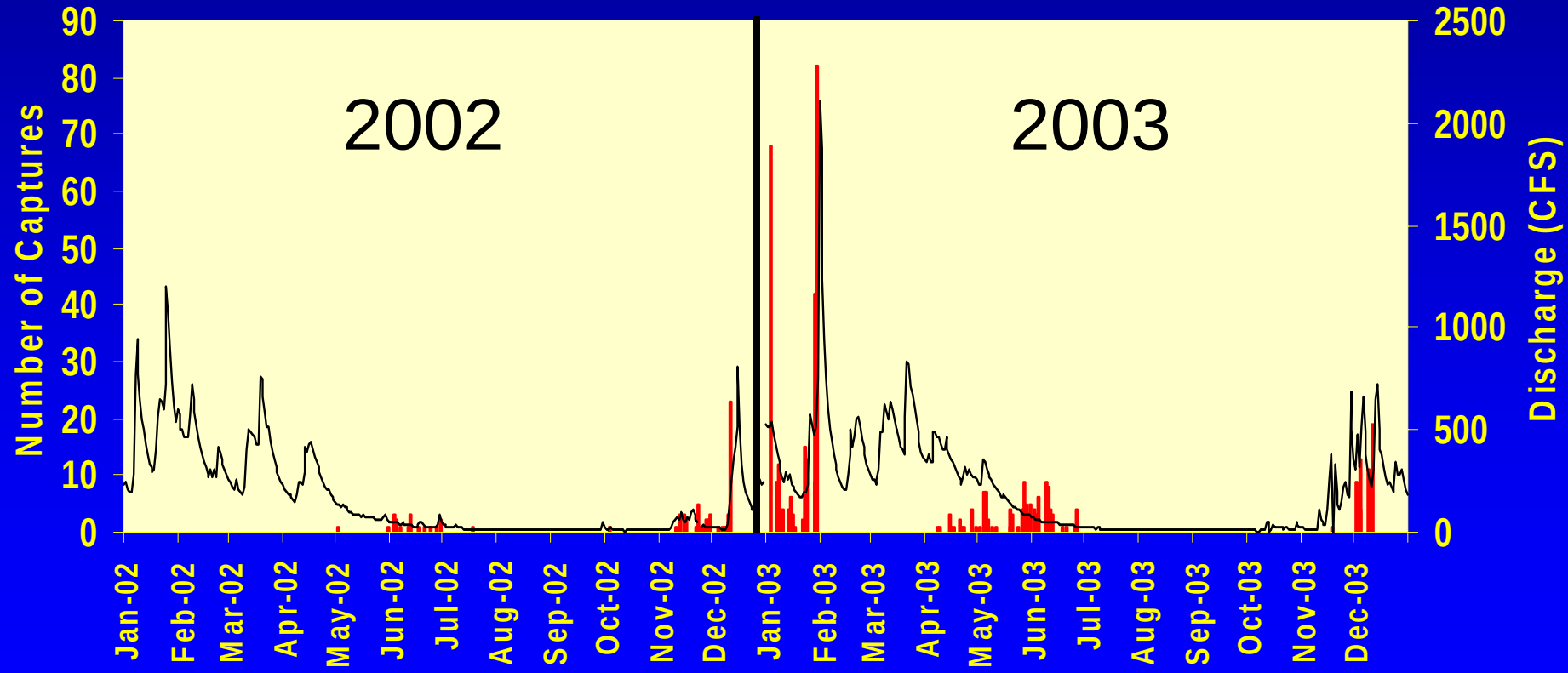
Year	Stage	Total Captured	Efficiency %	Retention %
2002	Ammocoete	240	14	51
	Macropthalmia	76	10	64
2003	Ammocoete	518	2	45
	Macropthalmia	460	9	74

- Ammocoete movement concurrent with macropthalmia outmigration
- 2 peaks in capture
- Ammocoetes: active vs. passive movement?
- Abundance estimates not calculated

2002-2003
Ammocoete Movement



2002-2003
Macropthalmia Movement



Objective 3

- Migration timing and population estimates for adults

  Method:

  - Adult Pot traps and Adult Fish Ladder
  - Length, weight, sex, spawning condition
  - PIT tag, fin clip (for 2nd mark and genetics)
  - Mark-recapture (rough pop. estimates)

Capturing Adults

Adult Ladder

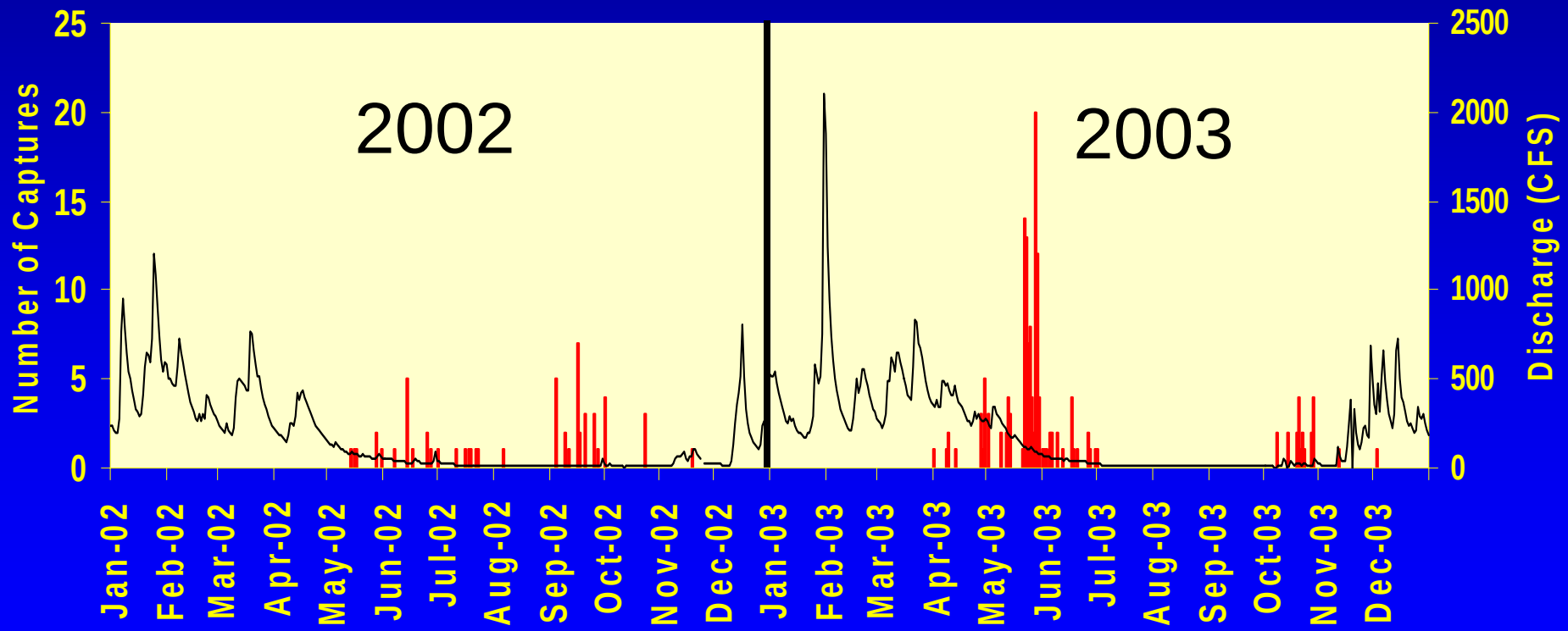
Pot Trap

Objective 3 Results

Year	# Captured	# Recaptured	Efficiency %
2002	56	5	9
2003	156	43	28

- Rough pop. estimates
  - 2002 – 700; 2003 – 693
- Movement: potentially two migration periods early summer/fall

2002-2003
Adult Movement



Objective 4

- Evaluate spawning habitat requirements of adult lampreys

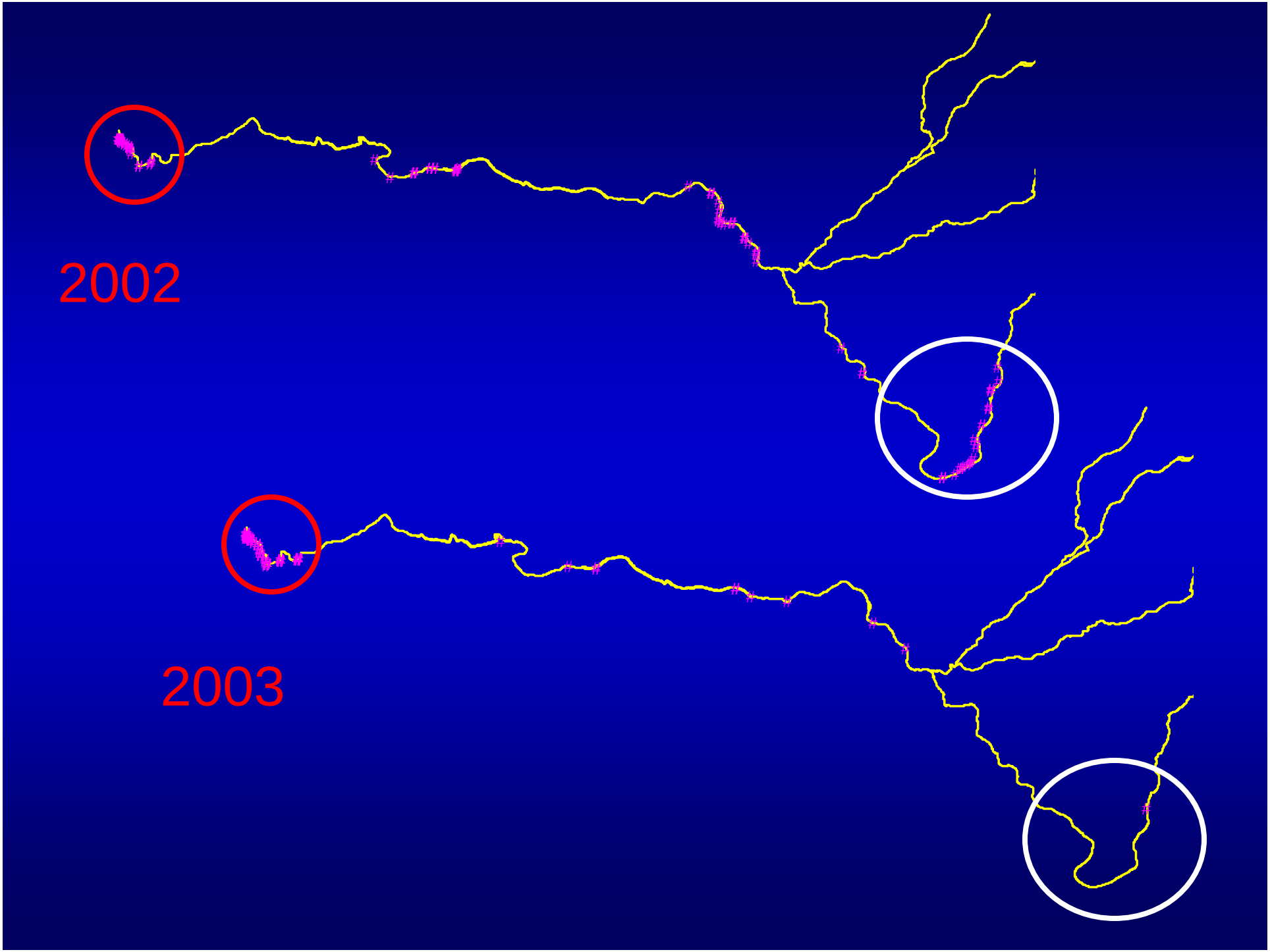
  Method: Spawning ground surveys throughout Cedar and Chelatchie Creeks

  - Dimensions
  - Substrate
  - Eggs present
  - Nest longevity
  - #/sex
  - Habitat type
  - Flow

Objective 4 Results

- PCL Nests

  2002 – 124; 2003 – 109
- Habitat types: Pool tail outs, runs, low gradient riffles with large gravel
- Appearance: Round depression, 21-23 in (533-584mm) in diameter, substrate stacked around perimeter
- Flow: 2-3 ft/sec


2002
2003

Adult Video

Gear Efficiency

Objective: Assess the 70% depletion model and the backpack electrofishing gear

Method: Controlled field study

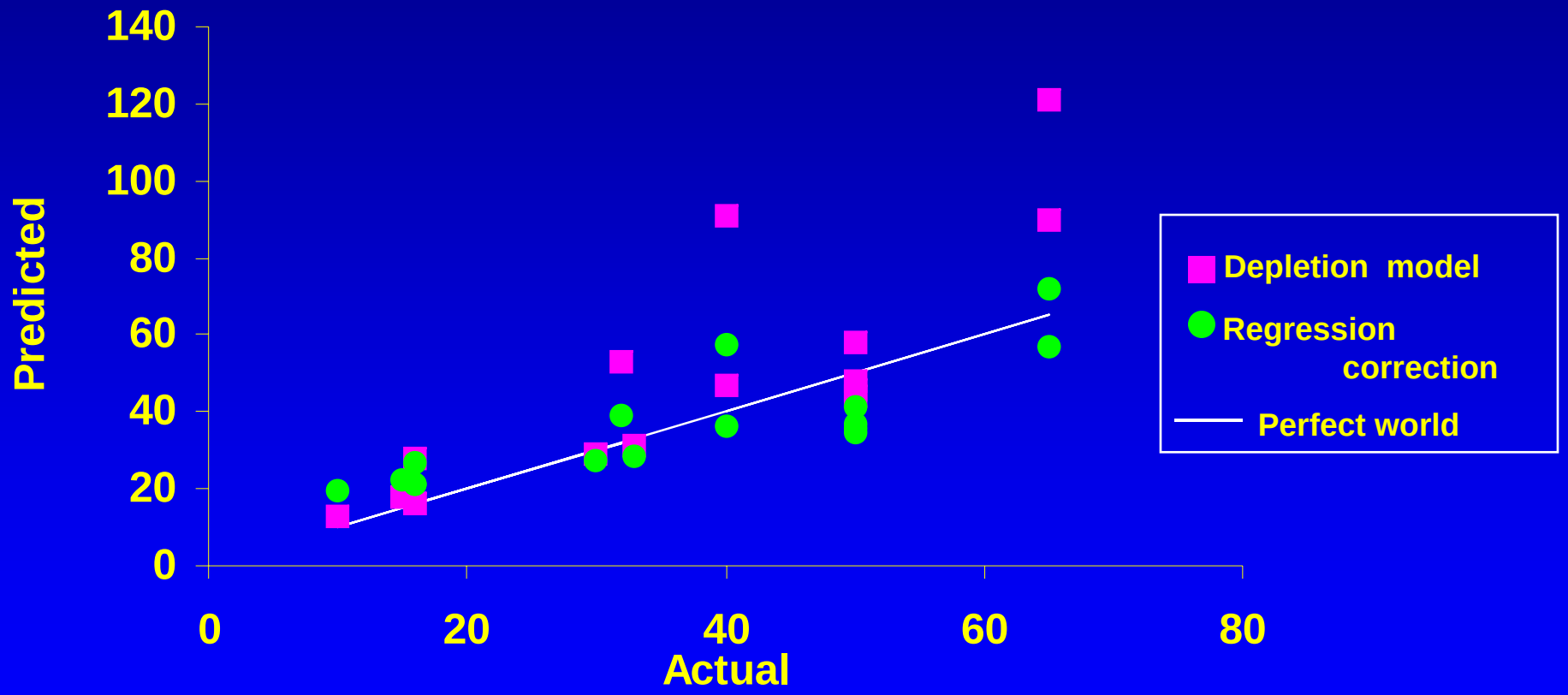
- 1 meter-squared net pens of varying density
- Conductivity, T, escapement monitored
- Substrate sterility tested
- Two size categories (>60mm, <60mm)
- #/categories equal in each trial
- 18-24 hour acclimation period

Gear Efficiency Preliminary Results

- 16 trials completed: 24-130 fish per trial
- 70% depletion model has associated error (bias: high density, <60 mm)
- Regression reduces some error

	Both Groups	>60 mm	<60 mm
Mean % Error	8	-6	28
Mean Abs. % Error	28	17	32
Regression Correction			
Mean % Error	2	2	13
Mean Abs. % Error	14	14	31

<60 mm Ammocoetes Only



Future Work 2004

- Relocate screw trap to the mouth
- Continue Gear Efficiency
- Characterize non-use areas for spawning (logistic regression)
- Increase catchability and population estimates for adults